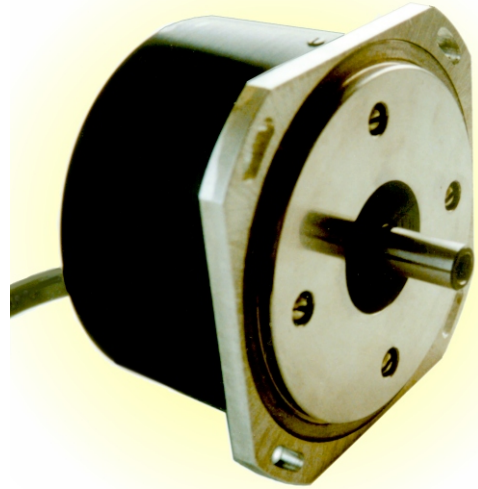


A110 PHOTOELECTRIC ROTARY ENCODER

(A110-A, A110-AV, A110-F)



The encoder **A110** is similar to the Heidenhain ROD 250 and ROD 271 type encoders in electrical parameters, mounting and overall dimensions.

The semi-precision photoelectric rotary encoder **A110** is used to establish an informational link between the key components of machines, industrial robots, comparators and DCC, NC or Digital Readout units. It gives information about the value and direction of the motion components. The encoder is used in automatic control, on-line gauging, in process monitoring systems, etc.

The encoder consists of three parts: mechanical, optical and electronic.

The mechanical part supports the rotation of the grating disc, fixes optical and electronic parts.

The optical part includes the light source, photosensitive diodes and grating elements.

The electronic part is made on the base of a specialized microchip.

The case of the encoder is fixed to an object by means of screws. The shaft of the encoder is connected with an object shaft by virtue of a compensating coupling.

The encoder has three versions by its output signals:

A110-A - sinusoidal signals, with amplitude approx. 11 μ A_{pp};

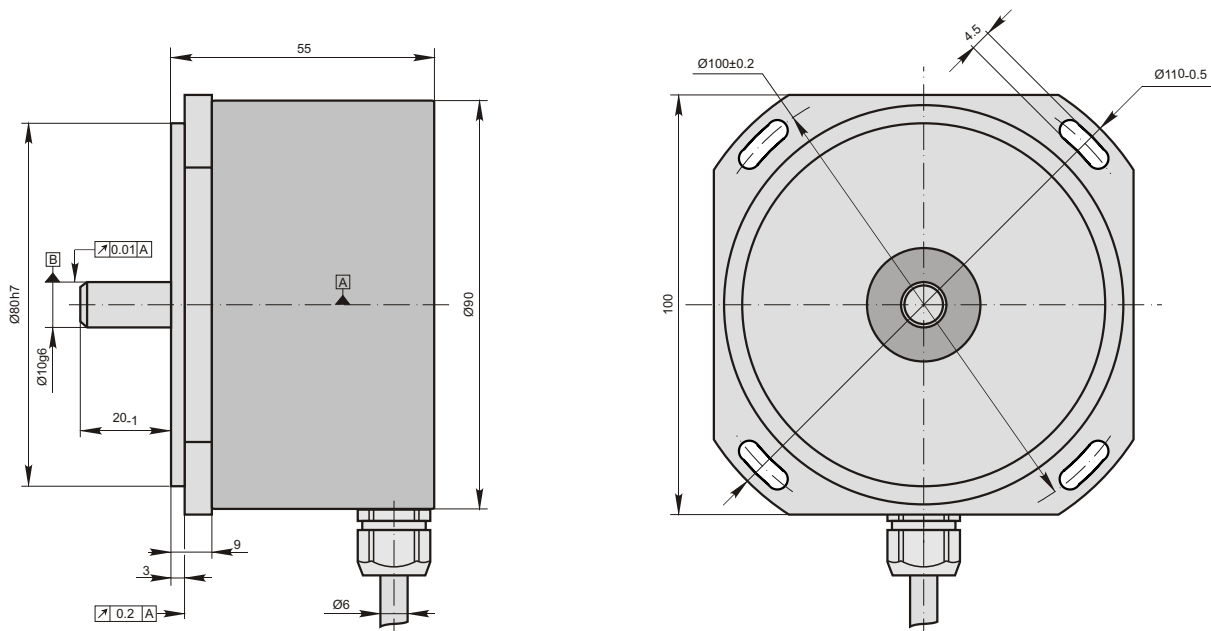
A110-AV - sinusoidal signals, with amplitude approx. 1 V_{pp};

A110-F - square-wave signals (TTL), with integrated subdividing electronics for interpolation x1, x2, x5 or x10.

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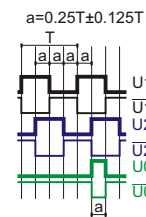
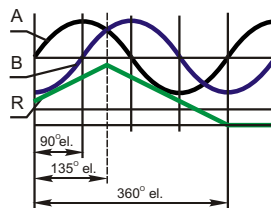
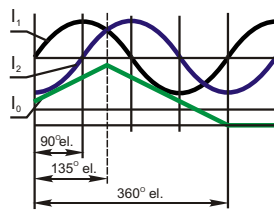
Mechanical Data

Line number:	9000	18000	Starting torque at 20°C	≤ 0.01 Nm
Number of output pulses per revolution for A110-F :	9000	18000	Moment of inertia of rotor	< 20×10 ⁻⁶ kgm ²
	36000	45000	Protection (IEC 529)	IP64
	90000	180000	Maximum weight without cable	0.7 kg
Maximum shaft speed	5000 rpm		Operating temperature	0...+50 °C
Maximum shaft load:			Storage temperature	-30...+80 °C
- axial	10 N		Maximum humidity	
- radial (at shaft end)	10 N		(without condensation of moisture)	98 %
Accuracy			Permissible vibration	≤ 100 m/s ²
- at line number = 9000	±7.5 arc. sec.		Permissible shock (6 ms)	≤ 300 m/s ²
- at line number ≥18000	±5.0 arc. sec.			



Electrical Data

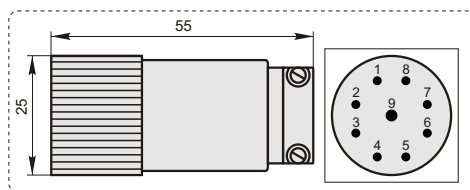
Version	A110-A $\sim 11 \mu\text{A}_{\text{pp}}$	A110-AV $\sim 1 \text{ V}_{\text{pp}}$	A110-F \square TTL
Power supply	+5 V $\pm 5\%$	+5 V $\pm 5\%$	+5 V $\pm 5\%$
Maximum consumed current (without load)	80 mA	120 mA	120 mA
Light source	LED	LED	LED
Incremental signals	Two sinusoidal I_1 and I_2 . Amplitude at 1 k load: - $I_1 = 7\text{-}16 \mu\text{A}$ - $I_2 = 7\text{-}16 \mu\text{A}$	Two sinusoidal A and B. Amplitude at 120 load: - A = 0.6-1.2 V - B = 0.6-1.2 V	Square-wave U_1 , U_2 and their inverted $\overline{U_1}$, $\overline{U_2}$. Signal levels at 20 mA load current: - low ("0" logic) $\leq 0.5 \text{ V}$ - high ("1" logic) $\geq 2.4 \text{ V}$
Reference signal	One quasi-triangle I_0 peak per revolution. Signal magnitude at 1 k load: - $I_0 = 2\text{-}8 \mu\text{A}$ (usable component)	One quasi-triangle R per revolution. Signal magnitude at 120 load: - R = 2-8 V (usable component)	One square-wave U_0 and its inverted $\overline{U_0}$ per revolution. Signal levels at 20 mA load current: - low ("0" logic) $\leq 0.5 \text{ V}$ - high ("1" logic) $\geq 2.4 \text{ V}$
Maximum operating frequency	(-3 dB) $\geq 160 \text{ kHz}$	(-3 dB) $\geq 180 \text{ kHz}$	125 kHz
Direction of signals	I_2 lags I_1 with clockwise rotation (viewed from shaft side)	B lags A with clockwise rotation (viewed from shaft side)	U_2 lags U_1 with clockwise rotation (viewed from shaft side)
Maximum rising and falling time			$< 0.5 \mu\text{s}$
Standard cable length	1 m, without connector	1 m, without connector	1 m, without connector
Cable diameter	6 mm	6 mm	6 mm
Maximum cable length	5 m	15 m	30 m



Accessories

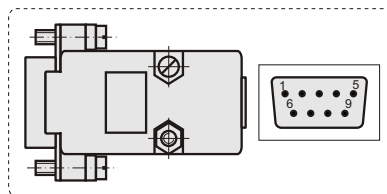
C9

9-pin round connector for A110-A



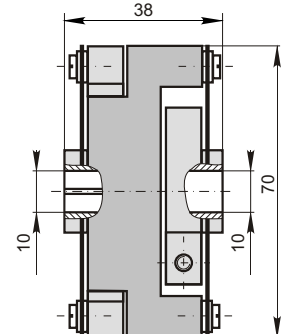
D9

9-pin flat connector for all versions of A110



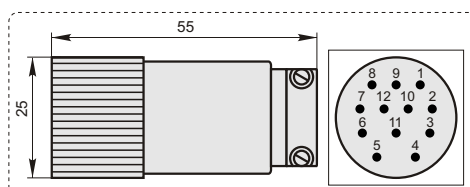
SC70

Coupling



C12

12-pin round connector for A110-AV and A110-F



Order form

A110 - X - X X X X X - X X / X - X

Version by output signals: A, AV or F	Impulse number: 9000... 180000	Cable length: 01 - 1m 02 - 2m 03 - 3m ... - ...	Type of connector: W - without connector D9 - flat, 9 pins C9 - round, 9 pins C12 - round, 12 pins	Coupling: 0 - without coupling 1 - with coupling
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